



**QUEEN'S
UNIVERSITY
BELFAST**

First trimester prediction of pre-eclampsia in high-risk women using 3D power Doppler placental vascularisation indices.

Eastwood, K-A., Patterson, C., Hunter, A., McCance, D., Young, I., & Holmes, V. (2017). First trimester prediction of pre-eclampsia in high-risk women using 3D power Doppler placental vascularisation indices. *Ultrasound in Obstetrics and Gynecology*, 50(S1), 222-222. [P21.04]. <https://doi.org/10.1002/uog.18211>

Published in:
Ultrasound in Obstetrics and Gynecology

Document Version:
Peer reviewed version

Queen's University Belfast - Research Portal:
[Link to publication record in Queen's University Belfast Research Portal](#)

Publisher rights
© The Authors 2017. © Ultrasound in Obstetrics & Gynecology. This work is made available online in accordance with the publisher's policies. Please refer to any applicable terms of use of the publisher.

General rights
Copyright for the publications made accessible via the Queen's University Belfast Research Portal is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy
The Research Portal is Queen's institutional repository that provides access to Queen's research output. Every effort has been made to ensure that content in the Research Portal does not infringe any person's rights, or applicable UK laws. If you discover content in the Research Portal that you believe breaches copyright or violates any law, please contact openaccess@qub.ac.uk.

First trimester prediction of pre-eclampsia in high risk women using 3D power Doppler placental vascularisation indices

Introduction: 3D Power Doppler (3DPD) imaging of the placenta enables evaluation of Placental Vascularisation Indices (PVIs). The aim of this study was to examine the ability of Vascularisation Index (VI, %), Flow Index (FI) and Vascularisation Flow Index (VFI) to predict pre-eclampsia (PET) in four groups of high risk women: (1) diabetes (type 1 and 2) (2) booking Body Mass Index (BMI) $>35\text{kg/m}^2$ (3) hypertension, renal disease, intrauterine growth restriction (4) thrombophilia, autoimmune disease.

Methods: Analysis was performed among women (n=194) recruited to the PREDICT study (prediction of PET in high-risk women). Women were recruited between 11+0 and 13+6 weeks gestation from a tertiary referral centre in Northern Ireland. PVIs were derived from 3DPD whole placental volume scanning via Virtual Organ Computer-aided Analysis (VOCAL) technique. Logistic regression models using PET as the outcome were determined for each PVI. Covariates included: study group, age, BMI, smoking status, aspirin use, parity, material deprivation of area of residence and Mean Arterial Pressure (MAP).

Results: The overall rate of PET was 12%. No significant differences in age, smoking status, deprivation or MAP were seen between groups. Significant differences in parity ($P=0.002$), BMI ($P<0.001$) and aspirin use ($P<0.001$) were noted. In the logistic regression model, a 1% increase in VI from a mean of 14.2 (SD 7.7) to 15.2% was associated with a 10% reduction in the odds of PET (OR 0.90, 95% CI 0.82-0.98, $P=0.02$) and a 1 unit increase in FI (mean 42.1, SD 10.3) was associated with a 6% reduction in the odds of PET (OR 0.94, 95% CI 0.89-1.0, $P=0.04$). A doubling in VFI (median 5.1, IQR 3.4-8.3) was associated with a 57% reduction in the odds of PET (OR 0.43, 95% CI 0.26-0.70, $P=0.001$).

Conclusions: Using logistic regression, VI, FI and VFI were predictive of PET in separate models controlling for confounding variables. This technique may be a useful adjunct for clinicians wishing to refine first trimester screening models to predict PET.